



Hearing the Buzz

We're turning the corner, and summer is winding down at my home on the Chippewa National Forest. Mornings are once again dark, and there is no longer time for coffee on the screen porch before heading off to work. Some dark mornings the bats have really put on a show for us, as they head back into their cozy attic roost in my old house. The "screamers" have left the neighborhood. A family of ravens, you could track the youngsters as they pursued their folks' hither and yon, loudly demanding food. Migrating nighthawks can be seen in the August sky. Bees seem especially frenetic as they visit my flower garden.

As summer wanes, I've been wondering if it's my imagination, or if the bees really are especially busy at summer's end? Have you noticed all the buzz about bees and other pollinators in the news lately? Just what is the concern?

Pollination is the process by which pollen transfers from one plant part to another, leading to fertilization and the development of seeds and fruit. Pollinators are birds, bats, bees, butterflies, moths, and other insects or animals that move pollen within flowers or from flower to flower. Did you know that over 80% of the world's flowering plants rely on pollinators?

Worldwide, many of our agricultural crops are pollinated by European honeybees. Not just domesticated bees are important to our food supply. In a recent international study of 41 crop systems on 6 continents, it was shown that healthy populations of wild bees are key to the successful yields of crops. At least 1/3 of our food depends on pollination.

So it is a concern that over the past 10 years, beekeepers in the U.S. and Europe have suffered annual bee hive losses of 30% or more. Wild bees are also declining in many places. What is the cause of this decline? There are potentially several. Loss of habitat, pathogens, malnutrition, mites, and pesticides are among the causes of concern.

One class of pesticide, in particular, has been suggested as being of special concern. Neonicotinoids are a class of pesticide that is applied via seed treatment. The pesticide is taken up through the seed and works its way into the plant, up into the flowers, and leaves residues in nectar. Most corn grown in the United States is treated with this class of pesticide, as well as much of our soybeans and a variety of other crops. It is also widely used on landscape plants and urban trees. It seems that many, many places that should sustain bees also expose them to neonicotinoids. It is thought that neonicotinoids interfere with the navigational abilities of bees, as well as compromise their immune systems. Neonicotinoids have been found in the soils of unplanted fields near planted fields, arriving there by drift. A recent US Geological Survey study

found them to be present in river water, having washed down through the soil. It would seem Neonicotinoids are pervasive in many environments, although they were only introduced relatively recently, in the mid-1990s.

Not the only environmental hazard out there, a 2010 survey reported 98 pesticides and metabolites were detected in bee pollen. We are in an era of unprecedented levels of agricultural pesticides. A US Geological Survey pesticide use map shows a dramatic increase in the use of glyphosate. In 1992, a few million pounds was annually used in the U.S. About 250 million pounds of this herbicide was applied in 2011, with much of the application occurring on Midwestern agricultural lands, including substantial portions of Minnesota.

A recent Star Tribune series helps to provide some insight into the Minnesota landscape relative to bees. About a third of Minnesota's land, as in much of the Midwest, is covered with two crops: corn and soybeans. These are plants that do not need bees for fertilization. Most Midwestern crops are genetically engineered to withstand the herbicide glyphosate, which allows for efficient weed control. But widespread herbicide use has eliminated most of the interspersed and adjacent milkweed, clover and wildflowers upon which bees feed. Urban areas result in many additional acres of grass and relatively little bee foraging opportunities. In short, habitat is limited for bees and other pollinators, and the habitat that is out there is often of very poor quality.

There are over 4,000 species of native bees in the U.S. In Minnesota, there are 350 – 400 species of bees. The dramatic bee decline is reflected in a 50% reduction in bee species found in Illinois from 1890 to 2010. In contrast, the rate of species decline has been far less at Itasca State Park, as indicated by a more modest reduction of species of leafcutter bees found in 2013 vs. those known in 1937. It is thought that species preservation at such a location is better perhaps due to preservation of bee habitats in protected areas.

In June of this year, President Obama issued a Presidential Memo, creating a federal strategy to promote the health of honey bees and other pollinators, and directing departments and agencies to engage in practices like planting pollinator-friendly vegetation, increasing flower diversity in their plantings, limit their mowing practices, and avoid the use of pesticides in sensitive pollinator habitats. The Forest Service is in a position to help increase and improve pollinator habitat on our Nation's National Forests and Grasslands by seeking to include native wildflowers that serve as food sources or host plants for native pollinators and managed honey bees in our restoration and wildlife habitat improvement projects.

A local example of practices to increase native plant diversity that may benefit a variety of pollinators exists in the wet meadow restoration projects undertaken on the Chippewa National Forest. Wet meadow ecosystems are fire-dependent communities occurring on the floodplains of streams and lakes. Non-forested communities, they are dominated by sedges, grasses, and forbs. When in suitable ecological condition, these meadows serve as habitat for over 70 vertebrate wildlife species, including waterfowl, songbirds, raptors, shorebirds, small mammals, and fish. No doubt any variety of native pollinators also takes advantage of the diversity of plant life found in wet meadows.

Over the years, fire control in habitats such as these results in a gradual conversion away from their open condition, towards a shrub-dominated community. Simplification of the plant community also occurs. Unburned meadows over time build up a heavy thatch layer, which excludes a variety of light-demanding forb species, and tend to become dominated by a few grass species. When periodic prescribed fire is applied to the system, there is an increase in the diversity of native forbs, which is likely to provide more habitat opportunities for plant pollinators.

The land ownership within the Chippewa's wet meadow systems is a complex mixture of Federal, State, County, Tribal, and private lands. Cooperative efforts and burn plans are required in order to allow this important landscape ecosystem to be managed across boundaries. These kinds of partnership burns have been practiced successfully across the Chippewa's landscape since the early 1990's, bringing benefit to a host of wildlife species as we work together to restore and maintain the ecosystem. The opportunity to manage landscapes on behalf of the bees and other wildlife is part of the power of your public lands.

In a time of declining habitats and habitat quality, it's going to take special efforts on the part of many people to turn around the declines in pollinator populations. A vital part of our food supply and our ecosystems, it's imperative that we investigate and address the multiple issues contributing to this situation. Developing wide-spread practices that support our pollinators is essential. Our Nation's wild lands can play a role as reservoirs for pollinators and the key ecosystem services they provide.



Photos by Libby Cable